Building Equitable Student Transit (BEST)

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Neighborhood-level Analysis of Transit Needs

EXECUTIVE SUMMARY

Understanding where public transit service is needed most can help transit planners design and implement systems that function well to connect travelers to opportunities. In this research brief, we use a number of different data sources to identify locations in the Sacramento City Unified School District (SCUSD) that have a high need for transit service improvements, based on neighborhood demographics, school choices, and existing transit service. We highlight results for the Oak Park neighborhood. The findings demonstrate an association between transportation conditions and student performance outcomes, suggesting that long travel times may contribute to reduced academic performance and increased absenteeism.

INTRODUCTION

Affordable, convenient, and reliable transportation is fundamentally important for ensuring that students can attend school and perform at their best. If students are unable to get to school, they will be at a greater risk for a number of negative outcomes including chronic absence, dropout, and ill health. Historically, the link between students and schools was provided by the iconic yellow bus. But in an environment of school district budget cuts, school bus services across California are being scaled back or cut entirely. According to the 2010-2012 California Household Travel Survey, across the state, about 8% of students use public transit to get to school, roughly the same proportion who rely on the school bus. The proportion of students relying on public transit is likely to grow over time, as school bus service continues its decline.

In this research brief, we highlight the unique challenges faced by **Sacramento City Unified School District (SCUSD)** students and families that are likely to depend on public transit service. Substantial differences exist between those who rely on public transit to meet daily needs and those who do not. According to the most recent ridership survey, 62% of Sacramento Regional Transit (RT) users either have no vehicle available or no driver's license; individuals residing in carless households compose only 5% of Sacramento County's population.[1] About half of RT's users who only ride the bus earn less than $35,000/year, whereas 65% of users who only use light rail earn more than $35,000/year. Because average districtwide travel time analyses (such as those provided in Research Brief 1) can mask difficult transportation conditions faced by particular neighborhoods or schools, here we focus on a neighborhood that has faced a changing set of challenges over time, Oak Park. In addition to this neighborhood focus, we also present a method for identifying locations with particularly high demand for public transit and that face relatively long travel times to school.

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[1] 2010-2014 American Community Survey five-year estimates, US Census Bureau.

RESEARCH METHODS

Using student records from the 2014-2015 academic year, we calculated an expected travel time to school for each student.[2] Times were calculated for both public transit and automobile. The transit travel time calculation relies on information on transit routes and schedules operated by Sacramento Regional Transit (RT) as of September 2, 2014. Travel times by public transit include walking to a transit stop, waiting for the vehicle, riding the vehicle, and walking to the destination. An average public transit travel time during the morning peak period (6:30am – 8:30am) was calculated for each census block in the district. In cases where walking to school would be faster than public transit, travel times reflect only walking speed. The automobile time was calculated using the Google Maps Distance Matrix API.[3]

OAK PARK CONDITIONS

We identified six census tracts that correspond roughly to the Oak Park neighborhood. These are shown in Figure 1, along with SCUSD's five neighborhood-serving high schools.

To assess the public transit conditions faced by students residing in Oak Park compared to other SCUSD students, we identified those residing in the neighborhood during the 2014-2015 academic year. We then calculated census demographics, student demographics, and travel times (for individual students by walking or walking/public transit and automobile) for various comparison groups. Table 1 demonstrates that rates of poverty and low vehicle ownership in Oak Park exceed those for the rest of the SCUSD—poverty rates are double and the proportion of zero-vehicle households is greater by approximately 45%. These demographics, combined with Oak Park's proximity to downtown Sacramento where transit service is concentrated, mean that Oak Park residents will be much more likely to rely on public transit than residents of the district as a whole.
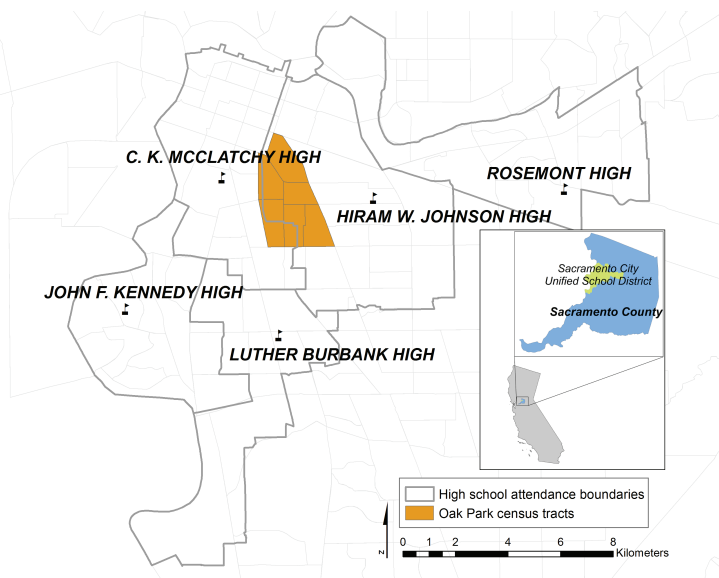

Figure 1. SCUSD neighborhood high school attendance boundaries (for reference) and Oak Park census tracts.

Table 1. Census demographics (American Community Survey 2010-2014 five-year estimates) for Oak Park and the rest of SCUSD.

	Total Families in Poverty	Proportion Families in Poverty	Total Zero-Vehicle Households	Proportion Zero-Vehicle Households
SCUSD	10,850	15%	13,760	11%
Oak Park	1,518	30%	1,365	16%

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[2] Like Research Brief 1, the analysis presented here is limited by a lack of knowledge regarding which students actually take public transit. But it acknowledges that the propensity to use transit is dependent in part on demographic characteristics and so focuses on particular neighborhoods where transit use is likely to be high.
[3] The API allows the user to generate many travel times and distances without having to type each into the Google Maps web interface.

Using the individual student-level records, Table 2 summarizes the travel conditions faced by students across the district as they travel to school as well as key performance measures. Results are shown for each school level, and are shown separately for students residing in Oak Park and those residing elsewhere in the district. On average, Oak Park residents are chronically absent[4] at higher rates and have lower GPAs than other SCUSD students. In general, the distances and travel times shown do not differ markedly between Oak Park and SCUSD averages. Students' homes tend to be located between approximately 1.5 and 3 miles from school. Traversing these distances takes about 5-10 minutes by car and 30-50 minutes by walking or walking/public transit.

Table 2. Average travel distances, times by walking or walking/public transit and driving, and student-level attendance and performance information for students residing in Oak Park (OP) and the rest of SCUSD (SC).

Grade Level	Number of Students	Distance (miles)	Walking or walking/transit time (minutes)	Driving time (minutes)	Average GPA	Average chronic absence rate
SC kindergarten	3,213	1.86	30.9	5.37	–	19%
OP kindergarten	299	1.82	30.9	5.95	–	27%
SC elementary	19,079	1.74	29.6	5.20	2.94	10%
OP elementary	1,873	1.65	29.2	5.64	2.00	16%
SC middle	5,804	2.87	44.5	7.40	2.87	11%
OP middle	533	2.92	47.2	9.25	2.49	17%
SC high	10,374	3.15	48.1	8.63	2.60	23%
OP high	902	2.81	48.6	9.21	2.27	30%

But Oak Park demographics suggest that more students there will rely on walking and public transit than in the district in general. The burden of this additional travel is clear; travel times greater than driving by approximately four or five times mean that students walking or taking public transit will have to rise earlier and have less time available for other activities. Participation in after-school activities might also be curtailed. Additionally, if a transit vehicle is late or if a student misses the bus, that student's likelihood of being absent or tardy that day will also increase.

LOCATIONS MOST IN NEED OF PUBLIC TRANSIT TO INCREASE SCHOOL ACCESS

In addition to focusing on a specific neighborhood known to have a high need for reliable and affordable public transportation, the travel time results developed for this work can be employed to identify other district locations experiencing high need for public transit service and facing relatively long travel times to school.

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[4] Here, students were identified as chronically absent if they missed 10% or more of enrolled days.

This analysis again uses individual student-level records to determine travel times between student home and school locations for high school students only.[5] To focus on places where students are likely to face burdensome travel times, we identify census tracts where there are high proportions of zero-vehicle households and families in poverty[6] and the average travel time by walking or walking/public transit exceeds the median (48.4 minutes). There are 17 census tracts that meet these criteria, containing 1,923 students. The 17 tracts are shown in Figure 2 and illustrate substantial overlap with Oak Park and other south and north Sacramento neighborhoods. Locations highlighted are likely to be good candidate sites for transit service improvements.
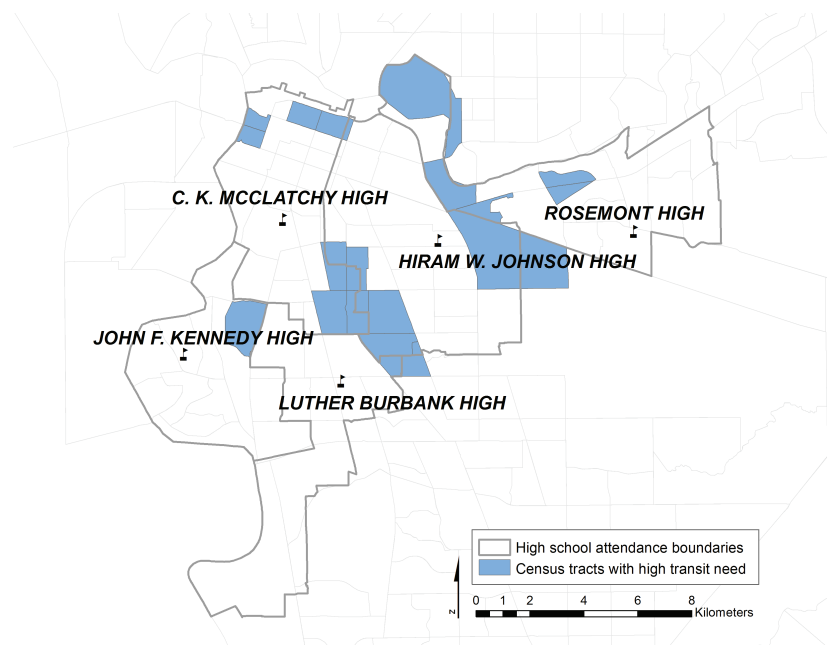

Figure 2. Identification of census tracts with a high need for public transit and relatively poor public transit service between students' home and school locations.

CONCLUSION

This research brief highlighted transportation conditions faced by SCUSD students who likely depend on public transit and demonstrated several ways that individual student-level record data can enrich analyses conducted using only publicly available data (such as those presented in Research Brief 1).

These results can be used to inform and advocate for improved transportation conditions among SCUSD's neighborhoods with high need. They are also some of the first to highlight an association between transportation conditions and student performance outcomes, including GPA and chronic absence rates. The Oak Park findings demonstrate academic performance and attendance disparities that exist between student populations who are more likely to need to travel by walking or public transportation and those who are more likely to commute to school by automobile.

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